

## **REMARKS**

Claims 1, 8 and 9 have been amended to claim the crosslinked rubber particles (B) have particle diameters of from 5 to 1000 nm and swelling indices in toluene of from 1 to 15 (Support is shown in now cancelled Claim 3) and wherein the gel content of the rubber particles (B) is from 80 to 100 wt.% (Support is shown in the Specification on Page 6, lines 1 – 3).

New Claim 14, which is dependent on Claim 1, claims the gel content being from 90 to 100 wt. % (Support is shown in the Specification on Page 6, lines 1 – 3).

### **I. Restriction Requirement.**

The Applicants confirm the Election of Group I, Claims 1 – 10 without traverse.

### **II. Claim Rejections**

Claims 6 – 7 were rejected under 35 U.S.C. 112, second paragraph, as being Indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

The Examiner indicates that the Applicants have failed to specify a basis for each of the claimed weight percent ranges. The Applicants respectfully submit that it known to one of ordinary skill in the art that the weight percent ranges are in relation to the weight percent of the copolymer. However, in order to further the case towards allowance, the Applicants have amended the claims to reflect that the weight percent is based on 100 weight percent of the respective copolymer.

Next, in Claim 7, the Examiner indicates that the use of “preferably” renders the claim indefinite. The Applicants have removed the range described after the word “preferably” and incorporated such range in new Claim 15. Accordingly, the Applicants respectfully submits that newly amended Claim 6 and 7 are definite. Claims 1 – 10 were rejected under 35 U.S.C. § 112, as containing subject matter which was not described in the Specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make

and/or use the invention. The Examiner indicates that it is unclear how components (A) and (B) interact with the multifunctional isocyanate, when neither (A) nor (B) contain functional groups that will react with an isocyanate.

The Applicants confirm that neither (A) nor (B) contain functional groups that will react with an isocyanate. It is also unclear to the Applicants as to how the reaction with isocyanate will take place. What is known, however, is that there are surprising results shown with compounds 2, 3, 4 and 5 of mixture series A.

### **III. Rejections under 35 U.S.C. § 102**

Claims 1 - 10 were rejected under 35 U.S.C. 102(b) as being anticipated by Dammann, et al. (U.S. Patent No. 5,232,531) or JP 57-212239 or JP 5-17630. Newly amended Claim 1 of the present invention claims rubber mixtures comprising uncrosslinked, double-bond-containing rubbers (A), crosslinked rubber particles (B) and multifunctional isocyanates (C), wherein the amount of component (B) in the mixture is from 1 to 150 parts by weight and the amount of multifunctional isocyanates (C) is from 1 to 100 parts by weight, in each case based on 100 parts by weight (phr) of the rubber component (A) and wherein said crosslinked rubber particles (B) have particle diameters of from 5 to 1000 nm and swelling indices in toluene of from 1 to 15 and wherein the gel content of the rubber particles (B) is from 80 to 100 wt.%. Claim 3 has been cancelled. Claims 2, and 4 - 7 are dependent on Claim 1. Newly amended Claim 8 claims a rubber vulcanizate containing the rubber mixture claimed in Claim 1. Newly Claim 9, claims a molded rubber body comprising the rubber mixture claimed in Claim 1. Claim 10, which is dependent on Claim 9, claims specific examples of molded rubber bodies.

The Examiner indicates that each of the above-references disclose rubber mixtures comprising a solid rubber component, considered to meet Applicants' component (B), a liquid diene rubber or halogenated butyl rubber, considered to meet Applicants' component (A), and an isocyanate component, considered to meet Applicants' component (C).

The Applicants respectfully submit that neither Dammann, et al., JP 57-212239 nor JP 5-17630 disclose or suggest a rubber mixture containing crosslinked rubber particles (B) having particle diameters of from 5 to 1000 nm and swelling

indices in toluene of from 1 to 15 and wherein the gel content of the rubber particles (B) is from 80 to 100 wt. %.

Dammann, et al. defines the "butyl rubber crosslinked after polymerization" by citing U.S. Patent No. 3,704,274. On page 6, line 23, it is stated that the crosslinked butyl rubber is a "crumb rubber", for which neither the size nor the degree of crosslinking are specified in any greater detail. Generally, for a crumb rubber, the diameter is in the range of mm's to cm's, not the presently claimed nm's.

JP 57-212239 discloses a mixture of the following components: a rubber consisting of (i) 70 – 95 parts of solid rubber and (ii) 30 – 5 parts of liquid rubber; (B) a masked isocyanate; and (C) Novolac.

In contrast, the presently claimed invention does not contain either JP 57-212239's component (C), or component (A)(ii), a liquid rubber. Furthermore, component (A)(i), does not disclose or suggest the presently claimed rubber gel.

JP 5-17630 discloses a mixture containing a powdered rubber, a rubber solution containing, in an inert solvent, of a hydroxyl-modified rubber and a polyfunctional isocyanate. The Applicants respectfully submit that JP 5-17630 does not disclose or suggest the presently claimed uncrosslinked rubber and a rubber gel. Furthermore, JP 5-17630 requires a hydroxyl-terminated liquid rubber which is clearly not claimed in the present invention.

Accordingly, the Applicant respectfully submits that the presently claimed invention of Claims 1, 2 and 4 - 10 are not anticipated by Dammann, et al., JP 57-212239 or JP 5-17630.

### **III. Rejections under 35 U.S.C. § 103**

Claims 1 – 10 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over Obrecht, et al. (DE 19701487), in view of Dammann, et al. or JP 57-212239 or JP 5-17630.

The Examiner indicates that Obrecht, et al. discloses rubber mixtures containing rubber gel and double bond containing rubber, wherein the mixture is useful for producing vulcanizates and molded articles. However, the Examiner indicates that Obrecht, et al. is silent regarding the addition of a polyisocyanate component to the composition. Therefore, the Examiner cites Dammann, et al., JP

57-212239 or JP 5-17630 as disclosing the use of polyisocyanates within rubber mixtures to improve physical properties was known at the time of the invention.

The Applicants remarks with respect to the above rejection concerning Dammann, et al., JP 57-212239 or JP 5-17630 are reiterated for the present rejection.

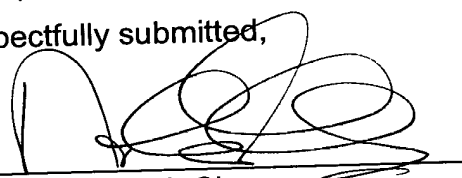
Accordingly, the Applicants respectfully submit that the claimed invention of Claims 1, 2 and 4 - 10 would not have been obvious to one having ordinary skill in the art at the time of the invention over Obrecht, et al., Dammann, et al., JP 57-212239 or JP 5-17630.

The Applicants respectfully submit that these references provide no motivation to one of ordinary skill in the art to Obrecht, et al. with Dammann, et al., JP 57-212239 or JP 5-17630. The issue of motivation is properly addressed in terms of one of ordinary skill in the art who has not had access to Applicant's Specification. As set forth by the court in *In re Dow Chemical*, 5 USPQ2d 1529 (CAFC, 1988) "the consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art". The proper standard clearly required by the court is that "both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure".

For any and all of the aforementioned reasons, reconsideration and early allowance of all pending claims is courteously requested.

Respectfully submitted,

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VERSION WITH MARKED CHANGES

In the Claims:

Kindly cancel Claims 3 and 11 - 12.

Kindly amend the claims as follows:

1. (Amended) Rubber mixtures comprising uncrosslinked, double-bond-containing rubbers (A), crosslinked rubber particles (B) and multifunctional isocyanates (C), wherein the amount of component (B) in the mixture is from 1 to 150 parts by weight and the amount of multifunctional isocyanates (C) is from 1 to 100 parts by weight, in each case based on 100 parts by weight (phr) of the rubber component (A) and wherein said crosslinked rubber particles (B) have particle diameters of from 5 to 1000 nm and swelling indices in toluene of from 1 to 15 and wherein the gel content of the rubber particles (B) is from 80 to 100 wt.%.

6. (Amended) Rubber mixtures according to Claim 1, wherein said uncrosslinked, double-bond-containing rubbers (A) are selected from the group consisting of natural rubber, styrene/butadiene rubber, polybutadiene rubber, nitrile rubber, butyl rubber, brominated isobutylene/isoprene copolymers having bromine contents of from 0.1 to 10 wt.% based on 100 wt.% of said brominated isobutylene/isoprene copolymer, chlorinated isobutylene/isoprene copolymers having chlorine contents of from 0.1 to 10 wt.% based on 100 wt.% of said chlorinated isobutylene/isoprene copolymer, hydrogenated or partially hydrogenated nitrile rubber, styrene/butadiene/acrylonitrile rubber, polychloroprene, epoxidized natural rubber or mixtures thereof, carboxylated nitrile rubbers and carboxylated styrene/butadiene copolymers.

7. (Amended) Rubber mixtures according to Claim 1, wherein said crosslinked rubber particles (B) include those which have been obtained by crosslinking of the following rubbers: polybutadiene, butadiene/acrylic acid C<sub>1-4</sub>-alkyl ester copolymers, polyisoprene, styrene/butadiene copolymers having styrene contents of from 1 to 60 wt.% based on 100 wt.% of said styrene/butadiene

copolymer, preferably from 5 to 50 wt.%, carboxylated styrene/butadiene  
copolymers, fluorine rubber, acrylate rubber, polybutadiene/acrylonitrile copolymers  
having acrylonitrile contents of from 5 to 60 wt.% based on 100 wt.% of said  
polybutadiene/acrylonitrile copolymer, carboxylated nitrile rubbers, polychloroprene,  
isobutylene/isoprene copolymers having isoprene contents of from 0.5 to 10 wt.%  
based on 100 wt.% of said brominated isobutylene/isoprene copolymer,  
isobutylene/isoprene copolymers having bromine contents of from 0.1 to 10 wt.%  
based on 100 wt.% of said isobutylene/isoprene copolymer, chlorinated  
isobutylene/isoprene copolymers having chlorine contents of from 0.1 to 10 wt.%  
based on 100 wt.% of said chlorinated isobutylene/isoprene copolymer, partially and  
completely hydrogenated nitrile rubbers, ethylene/propylene/diene copolymers,  
ethylene/acrylate copolymers, ethylene/vinyl acetate copolymers, epichlorohydrin  
rubbers, silicone rubbers, polyester urethane polymers and polyether urethane  
polymers.

8. (Amended) A rubber vulcanate comprising rubber mixtures, which  
comprise uncrosslinked, double-bond-containing rubbers (A), crosslinked rubber  
particles (B) and multifunctional isocyanates (C), wherein the amount of component  
(B) in the mixture is from 1 to 150 parts by weight and the amount of multifunctional  
isocyanates (C) is from 1 to 100 parts by weight, in each case based on 100 parts by  
weight (phr) of the rubber component (A) and wherein said crosslinked rubber  
particles (B) have particle diameters of from 5 to 1000 nm and swelling indices in  
toluene of from 1 to 15 and wherein the gel content of the rubber particles (B) is from  
80 to 100 wt.%.

9. (Amended) Molded rubber bodies comprising rubber mixtures, which  
comprise uncrosslinked, double-bond-containing rubbers (A), crosslinked rubber  
particles (B) and multifunctional isocyanates (C), wherein the amount of component  
(B) in the mixture is from 1 to 150 parts by weight and the amount of multifunctional  
isocyanates (C) is from 1 to 100 parts by weight, in each case based on 100 parts by  
weight (phr) of the rubber component (A) and wherein said crosslinked rubber  
particles (B) have particle diameters of from 5 to 1000 nm and swelling indices in

toluene of from 1 to 15 and wherein the gel content of the rubber particles (B) is from 80 to 100 wt.%.

Kindly add the following new Claims:

-- 13. A rubber mixture according to Claim 1, wherein said crosslinked rubber particles (B) have particle diameters of from 10 to 600 nm.

14. A rubber mixture according to Claim 1, wherein the gel content of the rubber particles (B) is from 90 to 100 wt.%.

15. A rubber mixture according to Claim 1, wherein said styrene/butadiene copolymers have styrene contents of from 5 to 50 wt.% based on 100 wt.% of said styrene/butadiene copolymer. --